

## General

### Guideline Title

Evidence-based care guideline for prevention and management of acute gastroenteritis (AGE) in children aged 2 months to 18 years.

### Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for prevention and management of acute gastroenteritis (AGE) in children aged 2 months to 18 years. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2011 Dec 21. 21 p. [116 references]

### Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence-based clinical care guideline for acute gastroenteritis (AGE) in children aged 2 months through 5 years. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 May. 15 p. [50 references]

## Recommendations

### Major Recommendations

The strength of the recommendation (strongly recommended, recommended, or no recommendation) and the quality of the evidence (1a-5) are defined at the end of the "Major Recommendations" field.

#### Prevention

1. It is recommended that infants be immunized against rotavirus according to the Advisory Committee on Immunization Practices (ACIP) recommendations, including during mild acute gastroenteritis (AGE) (Soares-Weiser et al., 2010 [1a]; Staat et al., 2011 [3a]; Committee on Infectious Diseases & American Academy of Pediatrics [AAP], 2009 [5]; Cortese & Parashar, 2009 [5]). See Appendix 1 in the original guideline document.
2. It is recommended that families be instructed on the benefit of:
  - Hand hygiene in the prevention of transmission of AGE in the home and at day care (Ejemot et al., 2008 [1a]), and
  - Breastfeeding as a protective practice against severe AGE in infants (Lamberti et al., 2011 [1a]; Dennehy et al., 2006 [4a]; Van der Wielen & Van Damme, 2008 [5]).

Note: Overall evidence demonstrates a protective effect of probiotics against AGE in children. Due to lack of specific evidence of cause of diarrhea, organism(s), dosage, and product availability, a specific recommendation for the use of probiotics in prevention of AGE is unable to be made (Sazawal et al., 2006 [1a]; Hojsak et al., "Lactobacillus GG in the prevention of nosocomial," 2010 [2a]; Hojsak et al., "Lactobacillus GG in the prevention of gastrointestinal," 2010 [2a]; Lin et al., 2009 [2b]).

## Assessment

### Clinical Assessment

3. It is recommended that the history and physical examination be the primary basis for the diagnosis of AGE (Porter et al., 2003 [3a]; Local Consensus, 2011 [5]; King et al., 2003 [5b]).
4. It is recommended that weight on presentation be documented as a baseline to guide rehydration therapy if needed (Steiner, DeWalt, & Byerley, 2004 [1b]; Snaith, Peutrell, & Ellis, 2008 [4b]).

Note: Acute weight loss based on a recent, documented pre-illness weight, as might be available in the office setting, is the most reliable measure of dehydration status on presentation (Steiner, DeWalt, & Byerley, 2004 [1b]).

5. It is recommended that clinical assessment be initially performed for the presence and degree of dehydration (none, some or severe) (Steiner, DeWalt, & Byerley, 2004 [1b]; Duggan et al., 1996 [2a]; King et al., 2003 [5b]). See Table 2 in the original guideline document for a Clinical Dehydration Scale (CDS), valid for children under age 5 years (Friedman et al., 2004 [2a]).

Note 1: Although the CDS is the tool with the most published evidence of validity, other clinical signs and symptoms have been shown to be helpful in diagnosing degree of dehydration, and severe dehydration can exist even in the absence of a toxic appearance (Gorelick, Shaw, & Murphy, 1997 [3a]). See Appendix 2 and Appendix 3 in the original guideline document for additional tools and information regarding clinical assessment for dehydration.

Note 2: A meta-analysis of clinical signs and symptoms of dehydration in children identified abnormal capillary refill time as the most useful individual sign for predicting some dehydration (likelihood ratio [LR], 4.1; 95% confidence interval: 1.7, 9.8) against a gold standard of rehydration weight. As capillary refill time is not included in the CDS, it is prudent to include it in the routine assessment for dehydration (Steiner, DeWalt, & Byerley, 2004 [1b]).

### Laboratory Studies

6. It is recommended that laboratory tests not be routinely performed in children with signs and symptoms of AGE; e.g., serum electrolytes, tests for specific pathogens, and urinary indices (Steiner, DeWalt, & Byerley, 2004 [1b]; Steiner, Nager, & Wang, 2007 [3b]; Local Consensus, 2011 [5]).

Note 1: Serum electrolytes are sometimes useful in assessing children with dehydration and who require intravenous (IV) fluids. In the absence of evidence-based criteria to direct selective electrolyte screening, clinical judgment regarding when to obtain electrolyte studies is superior to routine screening in protecting children from unnecessary testing (Steiner, DeWalt, & Byerley, 2004 [1b]; Wathen, MacKenzie, & Bothner, 2004 [3b]; Parkin et al., 2010 [4b]; Local Consensus, 2011 [5]; Rhee & Silverstein, 2005 [5]; Steiner, DeWalt, & Byerley, 2005 [5]; Tarini & Mendoza, 2005 [5]).

Note 2: Consider obtaining stool testing if there is a specific pathogen community outbreak; or for children who are less than 3 months of age, have grossly bloody stools, are immunocompromised, septic, toxic, or who have a history of foreign travel (Guarino et al., 2008 [5a]). A specific pathogen community outbreak may trigger health department testing requirements prior to return to day care (Ohio Administrative Code, 2009 [5]).

## Management

### Rehydration: Some or No Dehydration

7. It is recommended that children with some or no dehydration, including those with recurrent vomiting, be managed by frequent phone or office/urgent care follow up and, on occasion, emergency department encounters (Local Consensus, 2011 [5]; Guarino et al., 2008 [5a]).
8. It is recommended, for the child with some or no dehydration:
  - Use of the child's preferred, usual, and age appropriate diet and fluids (Brown, Peerson, & Fontaine, 1994 [1b]; Fayad et al., 1993 [2a]; Alarcon et al., 1992 [2b]; Margolis et al., 1990 [2b]), and
  - Offer commercial oral rehydration solution (ORS), if tolerated and if losses exceed intake, until an adequate degree of rehydration is achieved (Hartling et al., 2006 [1a]; Fonseca, Holdgate, & Craig, 2004 [1a]). See Table 3 in the original guideline document for suggested directions for use. See Appendix 4 in the original guideline document for information on specific ORS options.
  - Offer about 10 mL/kg of ORS for each loose stool or vomiting episode (Armon et al., 2001 [5a]).
9. It is recommended that the following not be used:
  - Restrictive or progressive diets (Alarcon et al., 1991 [2b]; Margolis et al., 1990 [2b]; Khin et al., 1985 [2b]; Placzek & Walker-Smith, 1984 [2b])
  - A clear liquid diet (King et al., 2003 [5b]) (see Appendix 4 in the original guideline document)
  - Diluted milk or formula (Brown, Peerson, & Fontaine, 1994 [1b])

- Lactose-free formula, unless previously-known lactose intolerance is present (Brown, Peerson, & Fontaine, 1994 [1b])

## Rehydration When Intravenous (IV) Therapy Is Chosen

### 10. It is recommended,

- When unable to replace the estimated fluid deficit and keep up with the on-going losses using oral feedings alone, and/or
- For severely dehydrated children,

That a bolus of IV isotonic solution (i.e. lactated Ringer's solution or normal saline) be administered until signs of dehydration have been reversed.

Suggested initial therapy:

- 20mL/kg body weight bolus over 30 to 60 minutes with reassessment and repeat if necessary

(Hartling et al., 2006 [1a]; Fonseca, Holdgate, & Craig, 2004 [1a]; Nager & Wang, 2010 [2b]; Neville et al., 2006 [2b]; Spandorfer et al., 2005 [2b]; King et al., 2003 [5b]; Khanna et al., 2009 [5]).

Note 1: Two small studies by a single author demonstrated that initial bolus therapy at a rate of 50 mL/kg body weight is a viable alternative (Nager & Wang, 2010 [2b]; Nager & Wang, 2002 [2b]).

Note 2: Nasogastric (NG) as compared to IV rehydration is as efficacious, is no more labor intensive, and is associated with fewer complications (Rouhani et al., 2011 [1b]). For the purposes of this guideline NG may be substituted for IV rehydration, but due to its infrequent use at Cincinnati Children's Hospital Medical Center (CCHMC), it is not otherwise mentioned in this document. It is appropriate to involve the family in the decision regarding the selection of IV versus NG for fluid replacement.

## Oral and IV Fluids After Initial Rehydration Bolus

### 11. It is recommended that the child treated with IV fluids continue, as soon as tolerated, with:

- A preferred, usual, and age appropriate diet and fluids, which may include commercial ORS (Fayad et al., 1993 [2a]; Cohen et al., 1995 [2b]; Fox et al., 1990 [2b]; Hjelt et al., 1989 [2b]; Khin et al., 1985 [2b]), and
- About 10 mL/kg of ORS for each loose stool or vomiting episode (Armon et al., 2001 [5a]).

### 12. It is recommended that ongoing reassessment of hydration status and tolerance of oral rehydration therapy (ORT) be used to guide the need for and choice of IV fluids after initial isotonic bolus:

- For the hydrated child able to tolerate oral rehydration therapy, discontinue IV therapy
- For the child not fully hydrated upon reassessment, give additional isotonic fluids as a bolus
- For the hydrated child unable to tolerate sufficient oral rehydration therapy to replace losses
  - Give half-normal saline with 5% dextrose at a maintenance volume plus calculated replacement for losses
  - After child begins to urinate (or if serum electrolytes are known to be normal) add 20 mEq/L potassium chloride

(Kannan et al., 2010 [2a]; Neville et al., 2010 [2a]; Montanana et al., 2008 [2a]; Yung & Keeley, 2009 [2b]; Drysdale et al., 2010 [4a]; Hanna & Saberi, 2010 [4a]; Snaith, Peutrell, & Ellis, 2008 [4b]; Holliday & Segar, 1957 [5])

Note 1: Patients with abnormal plasma sodium levels or abnormal kidney function are excluded from the target population for this guideline and from all of the cited studies for this recommendation. Individual consideration for these patients is particularly important regarding maintenance fluids.

Note 2: The grade of the body of evidence is high for not using less than 0.45% saline during the first 24 hours of IV fluid therapy for children with normal kidney function (Kannan et al., 2010 [2a]; Yung & Keeley, 2009 [2b]; Hanna & Saberi, 2010 [4a]).

## Inpatient Management

### 13. It is recommended that a child be admitted for inpatient care when:

- The child is severely dehydrated
- The child has intractable vomiting
- The child is unable to maintain hydration orally due to vomiting or diarrhea losses
- Caregivers cannot provide adequate care at home and/or there are social or logistical concerns

(Local Consensus, 2011 [5]; Guarino et al., 2008 [5a]).

### 14. It is recommended, if the child requires IV fluids for more than 24 hours, or if reassessment reveals evidence of fluid or electrolyte

imbalance, that selection and adjustment of IV fluid and rate of administration be based on sound principles and ongoing reassessment including:

- Frequent clinical assessment
- Daily weights, and
- Regular electrolyte monitoring as clinically indicated, at minimum every 2 to 3 days

(Neville et al., 2005 [3b]; Drysdale et al., 2010 [4a]; Moritz & Ayus, 2010 [5]; Holliday, Ray, & Freidman, 2007 [5]; Guarino et al., 2008 [5a]).

Note: Strict intake and output measurements (I/O) are ideal to guide therapy. However, standardized measured daily weights are less burdensome to obtain and are sufficient to guide therapy, while inaccurate I/O measurements are inadequate (Drysdale et al., 2010 [4a]; Snaith, Peutrell, & Ellis, 2008 [4b]).

### Adjunct Therapy

There is a growing body of literature establishing the effectiveness of selected probiotics as an adjunct to rehydration therapy in simple AGE. Proven efficacy is organism- and dose-dependent and there is no evidence of efficacy for most probiotic products (see Appendix 5 in the original guideline document for product information). In developed countries, *Lactobacillus rhamnosus* GG (LGG) given in a daily dose of 10 billion colony forming units per day (CFU/day) has proven efficacy, particularly in rotavirus, to reduce the duration of diarrhea, the risk of protracted diarrhea and the duration of hospitalization (Szajewska et al., 2007 [1a]; Guarino et al., 2008 [5a]).

15. It is recommended to talk to parents before making a decision about probiotic use. If a family chooses to use a probiotic, it is important to assure selection of an effective product (see Appendix 5 in the original guideline document).

To obtain best efficacy:

- Use a dose of at least 10 billion CFU/day of LGG (see Appendix 5 in the original guideline document regarding product availability)
- Start treatment as soon as possible
- Treat for a total of 5 to 7 days

(Szajewska, Skorka, & Dylag, 2007 [1a]; Szajewska et al., 2007 [1a]; Guandalini et al., 2000 [2a]; Local Consensus, 2011 [5]; Guarino et al., 2008 [5a]; Harris et al., 2008 [5a]).

Note: Parameters influencing the family's decision to use probiotics may include:

- Cost
- Evidence of benefit
- Likelihood of rotavirus origin
- Transmission concerns
- Safety

(Allen et al., 2010 [1a]; Szajewska et al., 2007 [1a]; Guandalini et al., 2000 [2a]). See Appendix 5 in the original guideline document for elaboration of these parameters.

### Other Therapy

16. It is recommended that antiemetics not be routinely used in the management of children with AGE (Fedorowicz, Jagannath, & Carter, 2011 [1a]; Szajewska, Gieruszczak-Bialek, & Dylag, 2007 [1a]).

Note 1: On 9/15/2011, the U.S. Food and Drug Administration (FDA) notified the healthcare community that ondansetron may increase the risk of developing prolongation of the QT interval of the electrocardiogram. Patients at risk for adverse outcomes include those with underlying heart conditions, such as congenital long QT syndrome, those who are predisposed to low levels of potassium and magnesium in the blood, and those taking other medications that lead to QT prolongation (Mehta, Sanatani, & Whyte, 2010 [2b]; FDA, 2011 [5]; McKechnie & Froese, 2010 [5]).

Note 2: Shared decision making may be employed in the consideration of ondansetron use in children with vomiting. Discussion points may include:

- Its use may decrease vomiting during the first hours after presentation
- Its use may decrease the need for IV fluids in the emergency department
- Its use may reduce hospitalization rates in those patients who require IV fluids
- Its use may increase diarrheal episodes

- It has a relatively high cost
- Most studies of ondansetron use in children with AGE have
  - Been performed only on mildly dehydrated children
  - Received funding from the manufacturer of ondansetron
- Its use may increase risk for long QT interval

(Fedorowicz, Jagannath, & Carter, 2011 [1a]; DeCamp et al., 2008 [1a]; Szajewska, Gieruszczak-Bialek, & Dylag, 2007 [1a]; Yilmaz, Yildizdas, & Sertdemir, 2010 [2a]; FDA, 2011 [5]).

17. It is recommended that antimicrobial therapies not be used except for cases of culture-proven pathology (Barbara et al., 2000 [3a]; Szajewska & Dziechciarz, 2010 [5]). See AAP Red Book for specifics (AAP, 2009 [5]).
18. It is recommended that antidiarrheal agents not be routinely used in the management of children with AGE (King et al., 2003 [5b]; Khanna et al., 2009 [5]).

#### Discharge Criteria

19. It is recommended that for children receiving care in a hospital setting, prompt discharge be considered when the following levels of recovery are reached:
  - Sufficient rehydration achieved as indicated by weight gain and/or clinical status
  - IV fluids not required
  - Oral intake equals or exceeds losses
  - Medical follow up is available via telephone or office visit
  - Adequate family teaching has occurred, including:
    - Hand hygiene at home, day care and elsewhere (see Recommendation #2 above) for prevention of AGE transmission
    - Expected course of illness
    - Prevention of dehydration
    - Signs of dehydration

(Local Consensus, 2011 [5])

#### Return to Social Life

20. It is recommended that a child with diarrhea of infectious or unknown cause return to day care only when transmission can be reliably prevented, preferably after the diarrhea has ceased (Local Consensus, 2011 [5]; Ohio Administrative Code, 2009 [5]). At minimum:
  - Stools are more formed
  - Stools are not leaking out of the diaper
  - Frequency of diaper changes are able to be handled by day care staff
  - For the toilet trained child, the child can make it to the bathroom without soiling
  - Good hand hygiene is practiced by day care staff

Note: Negative testing for certain pathogens may be required by law or by the day care facility (Local Consensus, 2011 [5]; Ohio Administrative Code, 2009 [5]).

#### Definitions:

#### Table of Evidence Levels

Quality Level	Definition
1a <sup>†</sup> or 1b <sup>†</sup>	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5	Other: general review, expert opinion, case report, consensus report, or guideline

<sup>†</sup>a = good quality study; b = lesser quality study

## Table of Recommendation Strength

Strength	Definition
"Strongly recommended"	There is consensus that benefits clearly outweigh risks and burdens (or vice versa for negative recommendations).
"Recommended"	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation made	There is a lack of consensus to direct development of a recommendation.
Dimensions: In determining the strength of a recommendation, the development group makes a considered judgment in a consensus process that incorporates critically appraised evidence, clinical experience, and other dimensions as listed below.	
<ol style="list-style-type: none"><li>1. Grade of the body of evidence</li><li>2. Safety/harm</li><li>3. Health benefit to the patients (direct benefit)</li><li>4. Burden to patient of adherence to recommendation (cost, hassle, discomfort, pain, motivation, ability to adhere, time)</li><li>5. Cost-effectiveness to healthcare system (balance of cost/savings of resources, staff time, and supplies based on published studies or onsite analysis)</li><li>6. Directness (the extent to which the body of evidence directly answers the clinical question [population/problem, intervention, comparison, outcome])</li><li>7. Impact on morbidity/mortality or quality of life</li></ol>	

## Clinical Algorithm(s)

A clinical algorithm for the evaluation and management for acute gastroenteritis in children aged 2 months to 18 years is provided in the original guideline document.

## Scope

### Disease/Condition(s)

Acute gastroenteritis

### Guideline Category

Diagnosis

Evaluation

Management

Prevention

Treatment

### Clinical Specialty

Emergency Medicine

Family Practice

Gastroenterology

Nursing

Nutrition

Pediatrics

## Intended Users

Advanced Practice Nurses

Allied Health Personnel

Dietitians

Hospitals

Nurses

Other

Patients

Physician Assistants

Physicians

Public Health Departments

## Guideline Objective(s)

In the target population, the objectives of this guideline are to:

- Decrease use of emergency department (ED) services for management of mild cases
- Improve the likelihood that information provided by triage and school personnel is adherent to guideline recommendations
- Reduce the length of stay in the emergency department and inpatient setting
- Reduce the rate of hospitalizations

## Target Population

Inclusions: This guideline is intended primarily for use:

- In children aged 2 months to 18 years of age
- With signs and symptoms of acute gastroenteritis
- With or without accompanying nausea, vomiting, fever, or abdominal pain

Exclusions: This guideline does NOT address all considerations needed to manage those with the following:

- Toxic appearance, shock, or requiring intensive care
- Episodes of diarrhea lasting longer than 7 days
- Previously diagnosed disorders including immunodeficiency or those affecting major organ systems
- Vomiting with no accompanying diarrhea for more than 24 hours
- Acute gastroenteritis (AGE) accompanying failure to thrive
- Diarrhea and/or vomiting accompanied by chronic metabolic disorders (e.g., diabetes, phenylketonuria [PKU])
- Diagnosis of hyponatremic or hypernatremic dehydration
- Diarrhea caused by chronic disease

Diarrhea is defined as three or more loose, watery stools a day.

# Interventions and Practices Considered

## Prevention

1. Immunization against rotavirus per Advisory Committee on Immunization Practices recommendations
2. Family instruction in hand hygiene
3. Breastfeeding infants

## Assessment/Evaluation

1. History and physical examination, including weight on presentation
2. Assessment of degree of dehydration with use of the Clinical Dehydration Scale (CDS)
3. Laboratory studies (not routinely recommended)
  - Serum electrolytes for children who require intravenous (IV) fluids
  - Stool testing in cases of specific pathogen community outbreak
  - Pathogen testing if negative result required for return to daycare

## Management

### No or Some Dehydration

1. Frequent telephone or office/urgent care follow up and, on occasion, emergency department visit
2. Usual, age appropriate diet
3. Small frequent feedings

### Some or Severe Dehydration

1. Bolus IV isotonic solution
2. Nasogastric rehydration
3. Prompt refeeding of usual and age appropriate diet after initial rehydration
4. Ongoing reassessment of hydration status and oral rehydration therapy (ORT) tolerance
5. Hospitalization
6. Reassessment of hydration status as indicated, including clinical assessment, daily weight, and electrolyte monitoring
7. Probiotics as adjunctive therapy (*Lactobacillus rhamnosus* GG)

### Other Therapy and Considerations

1. Antiemetics and antidiarrheals (not recommended routinely)
2. Antimicrobial therapy only in cases of culture-proven pathology
3. Patient/parent education
4. Discharge criteria
5. Patient return to social life

Note: Probiotics as a preventative were considered but not recommended because of lack of specific evidence. The following were considered and not recommended for children with some or no dehydration: restrictive or progressive diets, clear liquid diet, diluted milk or formula, lactose-free formula except in cases of known lactose intolerance.

## Major Outcomes Considered

- Length of inpatient stay
- Gastroenteritis admission rate
- Duration of rehydration therapy
- Duration of symptoms
- Cost of treatment

# Methodology

## Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

## Description of Methods Used to Collect/Select the Evidence

To select evidence for critical appraisal by the group for the update of this guideline, the Medline, EMBASE and the Cochrane databases were searched for dates of April 2003 to September 2011 to generate an unrefined, "combined evidence" database using a search strategy focused on answering clinical questions (see Appendix 6 in the original guideline document) relevant to acute gastroenteritis (AGE) for the target population and employing a combination of Boolean searching on human-indexed thesaurus terms (MeSH headings using an OVID Medline interface) and "natural language" searching on searching on human-indexed thesaurus terms (MeSH headings using an OVID Medline interface) and "natural language" searching on words in the title, abstract, and indexing terms. The citations were reduced by eliminating duplicates, review articles, non-English articles, and adult articles. The resulting abstracts were reviewed by a methodologist to eliminate low quality and irrelevant references. During the course of guideline development, additional clinical questions were generated and subjected to the search process, and some relevant review articles were identified.

## Number of Source Documents

Not stated

## Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

Table of Evidence Levels

Quality Level	Definition
1a <sup>†</sup> or 1b <sup>†</sup>	Systematic review, meta-analysis, or meta-synthesis of multiple studies
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4a or 4b	Weak study design for domain
5	Other: general review, expert opinion, case report, consensus report, or guideline

<sup>†</sup>a = good quality study; b = lesser quality study

## Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

## Description of the Methods Used to Analyze the Evidence

Not stated

## Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

The process by which this guideline was developed is documented in the Guideline Development and Update Process Manual; relevant development materials are kept electronically. The recommendations contained in this guideline were formulated by an interdisciplinary working group which performed systematic search and critical appraisal of the literature, using the Table of Evidence Levels described in the "Rating Scheme for the Strength of the Evidence" field, and examined current local clinical practices.

Recommendations have been formulated by a consensus process directed by best evidence, patient and family preference and clinical expertise. During formulation of these recommendations, the team members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues by consensus where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

## Rating Scheme for the Strength of the Recommendations

Table of Recommendation Strength

Strength	Definition
"Strongly recommended"	There is consensus that benefits clearly outweigh risks and burdens (or vice versa for negative recommendations).
"Recommended"	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation made	There is a lack of consensus to direct development of a recommendation.
Dimensions: In determining the strength of a recommendation, the development group makes a considered judgment in a consensus process that incorporates critically appraised evidence, clinical experience, and other dimensions as listed below.	
<ol style="list-style-type: none"><li>1. Grade of the body of evidence</li><li>2. Safety/harm</li><li>3. Health benefit to the patients (direct benefit)</li><li>4. Burden to patient of adherence to recommendation (cost, hassle, discomfort, pain, motivation, ability to adhere, time)</li><li>5. Cost-effectiveness to healthcare system (balance of cost/savings of resources, staff time, and supplies based on published studies or onsite analysis)</li><li>6. Directness (the extent to which the body of evidence directly answers the clinical question [population/problem, intervention, comparison, outcome])</li><li>7. Impact on morbidity/mortality or quality of life</li></ol>	

## Cost Analysis

Prior to the release of rotavirus vaccines in 2006 and 2008 (see Appendix 1 in the original guideline document) significant illness burden in the United States (U.S.) was attributable to AGE, including:

- 12% of hospitalizations of children less than 5 years of age and about 10% of all visits to pediatric emergency departments (ED)
- Approximately 1.5 million outpatient visits, 200,000 hospitalizations and 300 deaths annually
- An annual associated direct cost of \$250 million, with indirect costs of lost work and day care/school of 1 and 2 days, respectively, and

- Approximately one-third of this burden was attributed to rotavirus, which is more likely to cause severe clinical illness and dehydration than non-rotavirus acute gastroenteritis (AGE).

Since the introduction of rotavirus vaccine, disease burden due to AGE, as measured by healthcare utilization and costs, has decreased substantially. See Appendix 1 in the original guideline document for information on the recent and increasing impact of rotavirus vaccine.

#### Cost-Effectiveness

Post-licensure studies after the first two seasons of rotavirus vaccine use show decreases in costs of 55% to 75%, including medical costs (e.g., ED and hospitalization) and non-medical costs (e.g., lost earnings and family expenses to care for a child with AGE). However, these reductions are not predicted to offset the cost of the vaccine at its current price.

## Method of Guideline Validation

#### Clinical Validation-Pilot Testing

#### External Peer Review

#### Internal Peer Review

## Description of Method of Guideline Validation

Upon piloting of the *Lactobacillus rhamnosus* GG (LGG) recommendation, organizational barriers were addressed as follows:

- Education of clinical staff on the evidence base for the recommendation
- On-going dissemination of information about the recommendation to incoming teams of rotating clinicians
- LGG as a default order on the electronic medical record order set
- Availability of product in the organization's inpatient and outpatient pharmacies
- Availability of product to discharged patients in small number of doses from the organization's outpatient pharmacy
- Development of draft patient decision aid for starting or continuing *Lactobacillus rhamnosus* GG doses (has not been implemented at time of this publication)

The guideline has been reviewed and approved by clinical experts not involved in the development process, distributed to senior management, and other parties as appropriate to their intended purposes. The 2006 version of this guideline was included in a study of guideline quality and judged to be strongly recommended.

## Evidence Supporting the Recommendations

## References Supporting the Recommendations

AAP. American Academy of Pediatrics red book. 28th ed. Elk Grove Village (IL): American Academy of Pediatrics; 2009.

Alarcon P, Montoya R, Perez F, Dongo JW, Peerson JM, Brown KH. Clinical trial of home available, mixed diets versus a lactose-free, soy-protein formula for the dietary management of acute childhood diarrhea. *J Pediatr Gastroenterol Nutr*. 1991 Feb;12(2):224-32. [PubMed](#)

Alarcon P, Montoya R, Rivera J, Perez F, Peerson JM, Brown KH. Effect of inclusion of beans in a mixed diet for the treatment of Peruvian children with acute watery diarrhea. *Pediatrics*. 1992 Jul;90(1 Pt 1):58-65. [PubMed](#)

Allen SJ, Martinez EG, Gregorio GV, Dans LF. Probiotics for treating acute infectious diarrhoea. *Cochrane Database Syst Rev*. 2010; (11):CD003048. [PubMed](#)

Armon K, Stephenson T, MacFaul R, Eccleston P, Werneke U. An evidence and consensus based guideline for acute diarrhoea management. *Arch Dis Child*. 2001 Aug;85(2):132-42. [69 references] [PubMed](#)

Barbara G, Stanghellini V, Berti-Ceroni C, De Giorgio R, Salvioli B, Corradi F, Cremon C, Corinaldesi R. Role of antibiotic therapy on long-term germ excretion in faeces and digestive symptoms after Salmonella infection. *Aliment Pharmacol Ther*. 2000 Sep;14(9):1127-31. [PubMed](#)

Brown KH, Peerson JM, Fontaine O. Use of nonhuman milks in the dietary management of young children with acute diarrhea: a meta-analysis of clinical trials. *Pediatrics*. 1994 Jan;93(1):17-27. [PubMed](#)

Cohen MB, Mezzoff AG, Laney DW Jr, Bezerra JA, Beane BM, Drazner D, Baker R, Moran JR. Use of a single solution for oral rehydration and maintenance therapy of infants with diarrhea and mild to moderate dehydration. *Pediatrics*. 1995 May;95(5):639-45. [PubMed](#)

Committee on Infectious Diseases, American Academy of Pediatrics. Prevention of rotavirus disease: updated guidelines for use of rotavirus vaccine. *Pediatrics*. 2009 May;123(5):1412-20. [PubMed](#)

Cortese MM, Parashar UD, Centers for Disease Control and Prevention (CDC). Prevention of rotavirus gastroenteritis among infants and children: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2009 Feb 6;58(RR-2):1-25. [122 references] [PubMed](#)

DeCamp LR, Byerley JS, Doshi N, Steiner MJ. Use of antiemetic agents in acute gastroenteritis: a systematic review and meta-analysis. *Arch Pediatr Adolesc Med*. 2008 Sep;162(9):858-65. [33 references] [PubMed](#)

Dennehy PH, Cortese MM, Begue RE, Jaeger JL, Roberts NE, Zhang R, Rhodes P, Gentsch J, Ward R, Bernstein DI, Vitek C, Bresee JS, Staat MA. A case-control study to determine risk factors for hospitalization for rotavirus gastroenteritis in U.S. children. *Pediatr Infect Dis J*. 2006 Dec;25(12):1123-31. [PubMed](#)

Drysdale SB, Coulson T, Cronin N, Manjaly ZR, Piyasena C, North A, Ford-Adams ME, Broughton S. The impact of the National Patient Safety Agency intravenous fluid alert on iatrogenic hyponatraemia in children. *Eur J Pediatr*. 2010 Jul;169(7):813-7. [PubMed](#)

Duggan C, Refat M, Hashem M, Wolff M, Fayad I, Santosham M. How valid are clinical signs of dehydration in infants. *J Pediatr Gastroenterol Nutr*. 1996 Jan;22(1):56-61. [PubMed](#)

Ejemot RI, Ehiri JE, Meremikwu MM, Critchley JA. Hand washing for preventing diarrhoea. *Cochrane Database Syst Rev*. 2008; (1):CD004265. [76 references] [PubMed](#)

Fayad IM, Hashem M, Duggan C, Refat M, Bakir M, Fontaine O, Santosham M. Comparative efficacy of rice-based and glucose-based oral rehydration salts plus early reintroduction of food. *Lancet*. 1993 Sep 25;342(8874):772-5. [PubMed](#)

FDA: Zofran (ondansetron): drug safety communication - risk of abnormal heart rhythms. [Internet]. Silver Spring (MD): U.S. Food and Drug Administration (FDA); 2011 [accessed 2011 Oct 11].

Fedorowicz Z, Jagannath VA, Carter B. Antiemetics for reducing vomiting related to acute gastroenteritis in children and adolescents. *Cochrane Database Syst Rev*. 2011;(9):CD005506. [PubMed](#)

Fonseca BK, Holdgate A, Craig JC. Enteral vs intravenous rehydration therapy for children with gastroenteritis: a meta-analysis of randomized controlled trials. *Arch Pediatr Adolesc Med*. 2004 May;158(5):483-90. [PubMed](#)

Fox R, Leen CL, Dunbar EM, Ellis ME, Mandal BK. Acute gastroenteritis in infants under 6 months old. *Arch Dis Child*. 1990 Sep;65(9):936-8. [PubMed](#)

Friedman JN, Goldman RD, Srivastava R, Parkin PC. Development of a clinical dehydration scale for use in children between 1 and 36 months of age. *J Pediatr*. 2004 Aug;145(2):201-7. [PubMed](#)

Gorelick MH, Shaw KN, Murphy KO. Validity and reliability of clinical signs in the diagnosis of dehydration in children. *Pediatrics*. 1997 May;99(5):E6. [PubMed](#)

Guandalini S, Pensabene L, Zikri MA, Dias JA, Casali LG, Hoekstra H, Kolacek S, Massar K, Micetic-Turk D, Papadopoulou A, de Sousa JS, Sandhu B, Szajewska H, Weizman Z. Lactobacillus GG administered in oral rehydration solution to children with acute diarrhea: a multicenter European trial. *J Pediatr Gastroenterol Nutr*. 2000 Jan;30(1):54-60. [PubMed](#)

Guarino A, Albano F, Ashkenazi S, Gendrel D, Hoekstra JH, Shamir R, Szajewska H, European Society for Paediatric Gastroenterology, Hepatology, and Nutrition, European Society for Paediatric Infectious Diseases. European Society for Paediatric Gastroenterology, Hepatology, and Nutrition/European Society for Paediatric Infectious Diseases evidence-based guidelines for the management of acute gastroenteritis in children in Europe. *J Pediatr Gastroenterol Nutr*. 2008 May;46 Suppl 2:S81-122. [PubMed](#)

Hanna M, Saberi MS. Incidence of hyponatremia in children with gastroenteritis treated with hypotonic intravenous fluids. *Pediatr Nephrol*. 2010 Aug;25(8):1471-5. [PubMed](#)

Harris C, Wilkinson F, Mazza D, Turner T, Health for Kids Guideline Development Group. Evidence based guideline for the management of diarrhoea with or without vomiting in children. *Aust Fam Physician*. 2008 Jun;37(6 Spec No):22-9. [PubMed](#)

Hartling L, Bellemare S, Wiebe N, Russell K, Klassen TP, Craig W. Oral versus intravenous rehydration for treating dehydration due to gastroenteritis in children. *Cochrane Database Syst Rev*. 2006;(3):CD004390. [72 references] [PubMed](#)

Hjelt K, Paerregaard A, Petersen W, Christiansen L, Krasilnikoff PA. Rapid versus gradual refeeding in acute gastroenteritis in childhood: energy intake and weight gain. *J Pediatr Gastroenterol Nutr*. 1989 Jan;8(1):75-80. [PubMed](#)

Hojdak I, Abdovic S, Szajewska H, Milosevic M, Krznaric Z, Kolacek S. Lactobacillus GG in the prevention of nosocomial gastrointestinal and respiratory tract infections. *Pediatrics*. 2010 May;125(5):e1171-7. [PubMed](#)

Hojdak I, Snovak N, Abdovic S, Szajewska H, Misak Z, Kolacek S. Lactobacillus GG in the prevention of gastrointestinal and respiratory tract infections in children who attend day care centers: a randomized, double-blind, placebo-controlled trial. *Clin Nutr*. 2010 Jun;29(3):312-6. [PubMed](#)

Holliday MA, Ray PE, Friedman AL. Fluid therapy for children: facts, fashions and questions. *Arch Dis Child*. 2007 Jun;92(6):546-50. [54 references] [PubMed](#)

Holliday MA, Segar WE. The maintenance need for water in parenteral fluid therapy. *Pediatrics*. 1957 May;19(5):823-32. [PubMed](#)

Kannan L, Lodha R, Vivekanandhan S, Bagga A, Kabra SK, Kabra M. Intravenous fluid regimen and hyponatraemia among children: a randomized controlled trial. *Pediatr Nephrol*. 2010 Nov;25(11):2303-9. [PubMed](#)

Khanna R, Lakhanpaul M, Burman-Roy S, Murphy MS, Guideline Development Group and the technical team. Diarrhoea and vomiting caused by gastroenteritis in children under 5 years: summary of NICE guidance. *BMJ*. 2009;338:b1350. [PubMed](#)

Khin MU, Nyunt-Nyunt-Wai, Myo-Khin, Mu-Mu-Khin, Tin U, Thane-Toe. Effect on clinical outcome of breast feeding during acute diarrhoea. *Br Med J (Clin Res Ed)*. 1985 Feb 23;290(6468):587-9. [PubMed](#)

King CK, Glass R, Bresee JS, Duggan C. Managing acute gastroenteritis among children: oral rehydration, maintenance, and nutritional therapy. *MMWR Recomm Rep*. 2003 Nov 21;52(RR-16):1-16. [114 references] [PubMed](#)

Lamberti LM, Fischer Walker CL, Noiman A, Victora C, Black RE. Breastfeeding and the risk for diarrhea morbidity and mortality. *BMC Public Health*. 2011;11 Suppl 3:S15. [PubMed](#)

Lin JS, Chiu YH, Lin NT, Chu CH, Huang KC, Liao KW, Peng KC. Different effects of probiotic species/strains on infections in preschool children: A double-blind, randomized, controlled study. *Vaccine*. 2009 Feb 11;27(7):1073-9. [PubMed](#)

Margolis PA, Litteer T, Hare N, Pichichero M. Effects of unrestricted diet on mild infantile diarrhea. A practice-based study. *Am J Dis Child*. 1990 Feb;144(2):162-4. [PubMed](#)

McKechnie K, Froese A. Ventricular tachycardia after ondansetron administration in a child with undiagnosed long QT syndrome. *Can J Anaesth*. 2010 May;57(5):453-7. [PubMed](#)

Mehta D, Sanatani S, Whyte SD. The effects of droperidol and ondansetron on dispersion of myocardial repolarization in children. *Paediatr Anaesth*. 2010 Oct;20(10):905-12. [PubMed](#)

Montanana PA, Modesto i Alapont V, Ocon AP, Lopez PO, Lopez Prats JL, Toledo Parreno JD. The use of isotonic fluid as maintenance therapy prevents iatrogenic hyponatremia in pediatrics: a randomized, controlled open study. *Pediatr Crit Care Med*. 2008 Nov;9(6):589-97. [PubMed](#)

Moritz ML, Ayus JC. New aspects in the pathogenesis, prevention, and treatment of hyponatremic encephalopathy in children. *Pediatr Nephrol*. 2010 Jul;25(7):1225-38. [134 references] [PubMed](#)

Nager AL, Wang VJ. Comparison of nasogastric and intravenous methods of rehydration in pediatric patients with acute dehydration. *Pediatrics*. 2002 Apr;109(4):566-72. [PubMed](#)

Nager AL, Wang VJ. Comparison of ultrarapid and rapid intravenous hydration in pediatric patients with dehydration. *Am J Emerg Med*. 2010 Feb;28(2):123-9. [PubMed](#)

Neville KA, Sandeman DJ, Rubinstein A, Henry GM, McGlynn M, Walker JL. Prevention of hyponatremia during maintenance intravenous fluid administration: a prospective randomized study of fluid type versus fluid rate. *J Pediatr*. 2010 Feb;156(2):313-9.e1-2. [PubMed](#)

Neville KA, Verge CF, O'Meara MW, Walker JL. High antidiuretic hormone levels and hyponatremia in children with gastroenteritis. *Pediatrics*. 2005 Dec;116(6):1401-7. [PubMed](#)

Neville KA, Verge CF, Rosenberg AR, O'Meara MW, Walker JL. Isotonic is better than hypotonic saline for intravenous rehydration of children with gastroenteritis: a prospective randomised study. *Arch Dis Child*. 2006 Mar;91(3):226-32. [PubMed](#)

Ohio Administrative Code: Ohio Department of Health, Communicable Diseases, Isolation requirement. [Internet]. 2009 [accessed 2011 Oct 11].

Parkin PC, Macarthur C, Khambalia A, Goldman RD, Friedman JN. Clinical and laboratory assessment of dehydration severity in children with acute gastroenteritis. *Clin Pediatr (Phila)*. 2010 Mar;49(3):235-9. [PubMed](#)

Placzek M, Walker-Smith JA. Comparison of two feeding regimens following acute gastroenteritis in infancy. *J Pediatr Gastroenterol Nutr*. 1984 Mar;3(2):245-8. [PubMed](#)

Porter SC, Fleisher GR, Kohane IS, Mandl KD. The value of parental report for diagnosis and management of dehydration in the emergency department. *Ann Emerg Med*. 2003 Feb;41(2):196-205. [PubMed](#)

Rhee KE, Silverstein M. Use of serum electrolyte panels in gastroenteritis. *Pediatrics*. 2005 Apr;115(4):1108-9; author reply 1109. [PubMed](#)

Rouhani S, Meloney L, Ahn R, Nelson BD, Burke TF. Alternative rehydration methods: a systematic review and lessons for resource-limited care. *Pediatrics*. 2011 Mar;127(3):e748-57. [PubMed](#)

Sazawal S, Hiremath G, Dhingra U, Malik P, Deb S, Black RE. Efficacy of probiotics in prevention of acute diarrhoea: a meta-analysis of masked, randomised, placebo-controlled trials. *Lancet Infect Dis*. 2006 Jun;6(6):374-82. [58 references] [PubMed](#)

Snaith R, Peutrell J, Ellis D. An audit of intravenous fluid prescribing and plasma electrolyte monitoring: a comparison with guidelines from the National Patient Safety Agency. *Paediatr Anaesth*. 2008 Oct;18(10):940-6. [PubMed](#)

Soares-Weiser K, Maclehose H, Ben-Aharon I, Goldberg E, Pitan F, Cunliffe N. Vaccines for preventing rotavirus diarrhoea: vaccines in use. *Cochrane Database Syst Rev*. 2010;(5):CD008521. [139 references] [PubMed](#)

Spandorfer PR, Alessandrini EA, Joffe MD, Localio R, Shaw KN. Oral versus intravenous rehydration of moderately dehydrated children: a randomized, controlled trial. *Pediatrics*. 2005 Feb;115(2):295-301. [PubMed](#)

Staat MA, Payne DC, Donauer S, Weinberg GA, Edwards KM, Szilagyi PG, Griffin MR, Hall CB, Curns AT, Gentsch JR, Salisbury S, Fairbrother G, Parashar UD, New Vaccine Surveillance Network (NVSN). Effectiveness of pentavalent rotavirus vaccine against severe disease. *Pediatrics*. 2011 Aug;128(2):e267-75. [PubMed](#)

Steiner MJ, DeWalt DA, Byerley JS. Is this child dehydrated. *JAMA*. 2004 Jun 9;291(22):2746-54. [45 references] [PubMed](#)

Steiner MJ, DeWalt DA, Byerley JS. Use of serum electrolyte panels in gastroenteritis. *Pediatrics*. 2005 Apr;115(4):1108; author reply 1109-1. [PubMed](#)

Steiner MJ, Nager AL, Wang VJ. Urine specific gravity and other urinary indices: inaccurate tests for dehydration. *Pediatr Emerg Care*. 2007 May;23(5):298-303. [PubMed](#)

Szajewska H, Dziechciarz P. Gastrointestinal infections in the pediatric population. *Curr Opin Gastroenterol*. 2010 Jan;26(1):36-44. [26 references] [PubMed](#)

Szajewska H, Gieruszczak-Bialek D, Dylag M. Meta-analysis: ondansetron for vomiting in acute gastroenteritis in children. *Aliment Pharmacol Ther*. 2007 Feb 15;25(4):393-400. [PubMed](#)

Szajewska H, Skorka A, Dylag M. Meta-analysis: *Saccharomyces boulardii* for treating acute diarrhoea in children. [Erratum appears in *Aliment Pharmacol Ther*. 2009 Apr;29(7):800]. *Aliment Pharmacol Ther*. 2007 Feb 1;25(3):257-64. [PubMed](#)

Szajewska H, Skorka A, Ruszczynski M, Gieruszczak-Bialek D. Meta-analysis: *Lactobacillus GG* for treating acute diarrhoea in children. *Aliment Pharmacol Ther*. 2007 Apr 15;25(8):871-81. [52 references] [PubMed](#)

Tarini BA, Mendoza JA. Use of serum electrolyte panels in gastroenteritis. *Pediatrics*. 2005 Apr;115(4):1109; author reply 1109-1. [PubMed](#)

Van der Wielen M, Van Damme P. Pentavalent human-bovine (WC3) reassortant rotavirus vaccine in special populations: a review of data from the Rotavirus Efficacy and Safety Trial. *Eur J Clin Microbiol Infect Dis*. 2008 Jul;27(7):495-501. [43 references] [PubMed](#)

Wathen JE, MacKenzie T, Bothner JP. Usefulness of the serum electrolyte panel in the management of pediatric dehydration treated with intravenously administered fluids. *Pediatrics*. 2004 Nov;114(5):1227-34. [PubMed](#)

Yilmaz HL, Yildizdas RD, Sertdemir Y. Clinical trial: oral ondansetron for reducing vomiting secondary to acute gastroenteritis in children--a double-blind randomized study. *Aliment Pharmacol Ther*. 2010 Jan;31(1):82-91. [PubMed](#)

Yung M, Keeley S. Randomised controlled trial of intravenous maintenance fluids. *J Paediatr Child Health*. 2009 Jan-Feb;45(1-2):9-14. [PubMed](#)

## Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

## Benefits/Harms of Implementing the Guideline Recommendations

### Potential Benefits

- Prevention of transmission and reduction in severity of acute gastroenteritis
- Decreased use of emergency department (ED) services for management of mild cases
- Improvement in the likelihood that information provided by triage and school personnel is adherent to guideline recommendations
- Reduction in the length of stay in the ED and inpatient setting
- Reduction in the rate of hospitalization

## Potential Harms

Ondansetron may increase the risk of developing prolongation of the QT interval of the electrocardiogram. Patients at risk for adverse outcomes include those with underlying heart conditions, such as congenital long QT syndrome, those who are predisposed to low levels of potassium and magnesium in the blood, and those taking other medications that lead to QT prolongation.

## Qualifying Statements

### Qualifying Statements

These recommendations result from review of literature and practices current at the time of their formulations. This guideline does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this guideline is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

## Implementation of the Guideline

### Description of Implementation Strategy

An implementation strategy was not provided.

### Implementation Tools

Audit Criteria/Indicators

Chart Documentation/Checklists/Forms

Clinical Algorithm

Patient Resources

Quick Reference Guides/Physician Guides

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need

Getting Better

### IOM Domain

Effectiveness

Patient-centeredness

Safety

# Identifying Information and Availability

## Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for prevention and management of acute gastroenteritis (AGE) in children aged 2 months to 18 years. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2011 Dec 21. 21 p. [116 references]

## Adaptation

Not applicable: The guideline was not adapted from another source.

## Date Released

1999 Nov (revised 2011 Dec 21)

## Guideline Developer(s)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

## Source(s) of Funding

Cincinnati Children's Hospital Medical Center

The guideline was developed without external funding.

## Guideline Committee

Acute Gastroenteritis Team

## Composition of Group That Authored the Guideline

Team Members

*Community Physician:* \*William DeBuys, MD (*Chair*)

*Cincinnati Children's Hospital Medical Center (CCHMC) Physicians:* Amy Guiot, MD, General Pediatrics, Hospitalist; \*Scott Reeves, MD, Emergency Medicine; Sean Moore, MS, MD, Gastroenterology; David Hooper, MD, Nephrology; Beverly Connelly, MD, MPH, Infectious Diseases; Paul Bunch, MD, Chief Resident Physician; Stephanie Clark, MD, Chief Resident Physician; Robert Hufnagel, MD, Resident Physician; Lynn Lee, MD, Resident Physician

*Other Physician:* Andrea Lo Vecchio, MD, Resident in Pediatrics, Visiting Scholar from U of Naples "Federico II", Italy

*Patient Services:* \*Michelle Widecan, RN, CRNP, Emergency Department; Rebecca Wilhelm, RD, Nutrition Services; Trina Hemmelgarn, PharmD, Pharmacy, James M. Anderson Center for Health Systems Excellence; Wendy Gerhardt, Lead Guidelines Program Administrator; \*Eloise Clark, MPH, Guideline Developer; \*Danette Stanko-Lopp, MA, MPH, Epidemiologist; Karen Vonderhaar, RN, MSN, Methodologist

*Ad hoc Advisors:* \*Richard Ruddy, MD, Emergency Medicine, Director

\*Member of previous Acute Gastroenteritis guideline development teams

## Financial Disclosures/Conflicts of Interest

All Team Members and Anderson Center support staff listed above have signed a conflict of interest declaration and none were found.

## Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence-based clinical care guideline for acute gastroenteritis (AGE) in children aged 2 months through 5 years. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 May. 15 p. [50 references]

## Guideline Availability

Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#) .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at [EBDMInfo@cchmc.org](mailto:EBDMInfo@cchmc.org).

## Availability of Companion Documents

The following are available:

- Acute gastroenteritis (AGE). Guideline highlights. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2012. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the [Cincinnati Children's Hospital Medical Center Web site](#) .
- Phone triage form for child with acute gastroenteritis (AGE). Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2012. 1 p. Electronic copies: Available in PDF from the [Cincinnati Children's Hospital Medical Center Web site](#) .
- Acute gastroenteritis inpatient order set template. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2012. 1 p. Electronic copies: Available in PDF from the [Cincinnati Children's Hospital Medical Center Web site](#) .
- Table of evidence levels. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the [Cincinnati Children's Hospital Medical Center](#) .
- Grading a body of evidence to answer a clinical question. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the [Cincinnati Children's Hospital Medical Center](#) .
- Judging the strength of a recommendation. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the [Cincinnati Children's Hospital Medical Center](#) .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at [EBDMInfo@cchmc.org](mailto:EBDMInfo@cchmc.org).

Additional implementation tools, including proposed process and outcome measures, computerized provider order entry forms, history taking tool, and a model form for phone triage can be found in the [original guideline document](#) .

## Patient Resources

The following Health Topics are available:

- Gastroenteritis. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 Jun. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#) .
- Acute diarrhea. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 Sep. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#) .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide

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## NGC Status

This summary was completed by ECRI on September 1, 1998. The information was verified by the guideline developer on December 1, 1998. This summary was updated by ECRI on March 18, 2002, and reviewed by the guideline developer as of May 7, 2002. This summary was updated by ECRI on December 19, 2005. The updated information was verified by the guideline developer on January 9, 2006. This summary was updated by ECRI on July 14, 2006. The updated information was verified by the guideline developer on July 21, 2006. This NGC summary was updated on March 28, 2012. This summary was updated by ECRI Institute on September 10, 2012 following the U.S. Food and Drug Administration advisory on Ondansetron (Zofran). This summary was updated by ECRI Institute on December 12, 2012 following the U.S. Food and Drug Administration advisory on Ondansetron (Zofran).

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